

*Sue*

July 22, 1987

TO: Technical File

FROM: Rick P. Summers, Reclamation Hydrologist *RPS*

RE: Review of Response To Divisions Concerns (dated May 8, 1987), Ideal-Basic Industries, Devil's Slide Cement Plant, ACT/029/001, Morgan County, Utah

Rule M-3 Notice of Intention to Commence Mining Operations

- (1)(d) Attachment two and the USGS investigation map MF-290 contain the hydrology related information requested by this rule.
- (1)(e) The application commits to installation of the berms referenced in the Division's letter of January 15, 1987 and commits to installation of sediment control measures discussed onsite with Division representatives in December of 1986 (p. 7 and memo to technical file, R. Summers, dated October 29, 1985).

The mining operation will result in placement of spoil material in two canyons (Quarry Hollow and Bone Yard canyon). The applicant proposes to utilize a french drain consisting of gravity placed rock fragments to pass any expected flows in these drainages. Although state-of-the-art technology does not exist for design of these drains, a qualitative analysis can be performed. Peak flow values for the expected discharge from the 10, 25, 50, and 100 yr. - 6 hr. precipitation events have been computed (see attached calculations). Using input assumptions submitted by the applicant, a maximum flow of 36 cfs can be expected at the site (Quarry Hollow). The drain expected will be 25 to 30 ft. in depth with an estimated 30 to 40 ft. bottom width (application

and site observation). With an assumed 30 % void space expected from loose, gravity placed rock, it is expected that this drain will be significantly adequate to pass the expected 100 yr - 6 hr peak flow event.

(1)(f) The applicant has indicated the depth of water encountered in wells #1 and 2 (p. 9)

(1)(h) The applicant has not proposed any disposal of any water at the site.

Rule M-10 Reclamation Standards

3 & 13.

The application does not contain plans for removal/reclamation of the ponds onsite. If ponds are to be left onsite, the applicant must show structures that ensure the ponds will be self-draining and submit appropriate letters of approval for permanent impoundments. Therefore, the following condition to the permit is required:

✓ Condition M-10-RS

Prior to final permit approval, the applicant must submit complete and adequate designs and plans demonstrating compliance with Rule M-10 (3) and (13).

7. The application contains plans for reclamation and reconstruction of drainages for the Bone Yard and Quarry Canyon areas. The designs are based upon a 50 yr. - 6 hr. precipitation event.

8.)

The Division has not issued approval for placement of spoil in the Weber River floodplain. The applicant must ensure that continued placement of spoil from the haul road does not occur.

11. Sediment Control. The proposed mining operation is a dynamic process and therefore, traditional sediment control measures may not be applicable to this site. The applicant has proposed to construct catch basins as mining progresses to minimize transport of sediment off site.

Page 3  
Technical Memo  
ACT/029/001  
July 21, 1987

11 (cont) Additionally, a existing berm along the lower haul road and the proposed berm discussed previously will effectively contain the majority runoff from the disturbed area. Loose rock drains located along the berm will allow slow draining of the runoff and minimize sediment contribution from the site. To the east of the site, plant facilities and existing pasture will act as a sediment filter for the expected minimal sediment produced from disturbances on the east side of the property.

ptb  
cc: Sue Linner

6001R/86-88

## Peak flow calculations - Ideal - Basic

assumptions:

1) Precipitation  $10 \text{ yr} - 6 \text{ hr} = 1.4''$   
 $50 \text{ yr} - 6 \text{ hr} = 2.0''$  from Miller, et al.  
 $100 \text{ yr} - 6 \text{ hr} = 2.2''$

- 2) Type B storm distribution  
 3) 6 hr. storm duration  
 4) Curve Number

Quarry Hollow = 68  
 Bone Ford = 59

from Attachment 3.

Watershed	Hydraulic length (miles)	Elevation change (feet)	Time of concentration* (hours)
Quarry Hollow	1.924	1350.0	0.345
Bone Ford	1.242	790.0	0.255

from  $T_c = \left[ \frac{11.9(L)^3}{H} \right]^{.385}$  where  $L$  = hydraulic length (miles)  
 $H$  = elevation change (feet)

Results:

Watershed	DISCHARGE		
	$Q_{10 \text{ yr} - 6 \text{ hr.}}$ (cfs)	$Q_{50 \text{ yr} - 6 \text{ hr.}}$ (cfs)	$Q_{100 \text{ yr} - 6 \text{ hr.}}$
Quarry Hollow	6.5	23.0	35.9
Bone Ford	4.0	5.9	8.4

Drainage Plan Design Calculations:

watershed		Area (acres)	Area (sq ft)	CN	Ppt. *	T <sub>c</sub> **	Q <sub>10</sub>	Q <sub>25</sub>	Q <sub>50</sub>	Q <sub>100</sub>
Quarry Hollow	356.81 A (97.14 in <sup>2</sup> )	361	68	1.4	L=25.4'	6.48	15.9	22.9	35.89	
				1.8	H=5260					
				78	2.0	T <sub>c</sub> =0.345	29.14	X	108.70	142.4'
				2.2	"					
Bone Yard	248.24 A (67.58 in <sup>2</sup> )	247	59	1.4	L=16.4	.01	3.63	5.88	8.35	
				1.8	H=5260					7.7
				78	2.0	T <sub>c</sub> =				
				2.2	0.255	23.55	X	84.97	109.56	

\* calc using 385 L/min.  
T<sub>c</sub> = (11.9 L/H) H = CL

\* DGM values: from atlas + pin-point stationing.

Applicants = 10% = 1.8" 100% = 2.8" denotation, not